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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/470,236	11/15/1999	ANDREW D. BAILEY III	LAM1P123/P05	5922

22434 7590 05/06/2002  
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EXAMINER
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ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

18

DATE MAILED: 05/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/470,236

Applicant(s)

BAILEY ET AL.

Examiner

Luz L. Alejandro

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 16.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other:

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### **DETAILED ACTION**

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, and 5-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishii et al., U.S. Patent 5,571,366.

The rejection is maintained as stated in paper #15 mailed 1-4-02 for the reasons of record.

Claims 1-5, 7-8, and 12-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al., U.S. Patent 5,522,934.

The rejection is maintained as stated in paper #15 mailed 1-4-02 for the reasons of record.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al., U.S. Patent 5,571,366 in view of Singh et al., U.S. Patent 6,042,687.

The rejection is maintained as stated in paper #15 mailed 1-4-02 for the reasons of record.

Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al., U.S. Patent 5,522,934 in view of Li et al., U.S. Patent 6,009,830 or Ishii et al., U.S. Patent 5,571,366.

The rejection is maintained as stated in paper #15 mailed 1-4-02 for the reasons of record.

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Claims 1-5, 7-9, and 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al., U.S. Patent 6,009,830 in view of Suzuki et al., U.S. Patent 5,522,934.

The rejection is maintained as stated in paper #15 mailed 1-4-02 for the reasons of record.

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. in view of Suzuki et al. as applied to claims 1-5, 7-9, and 12-18 above, and further in view of Singh et al., U.S. Patent 6,042,687.

The rejection is maintained as stated in paper #15 mailed 1-4-02 for the reasons of record.

Claims 19-25 and 28-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al., U.S. Patent 5,810,932 in view of Kadomura, U.S. Patent 6,096,160 and further in view of Ishii et al., U.S. Patent 5,571,366 or Suzuki et al., U.S. Patent 5,522,934.

Ueda et al. shows the invention substantially as claimed including a chamber 15 which is in the shape of a cylinder in which plasma is generated; a coupling window 11 disposed at an upper end of the chamber; an RF antenna 12 disposed above a plane defined by the substrate; and an electromagnet arrangement 14 proximate the antenna (see Fig. 7 and abstract).

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Ueda et al. lacks anticipation of a controller to vary a magnitude of the magnetic field and the gas flow system as claimed. Kadomura discloses a magnet arrangement 53 whereby a dc power supply 68 is coupled to the magnets and is varied in a controlled manner (see abstract) in order to better control the plasma. In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the controlling system of Kadomura in the primary reference of Ueda et al. because such a control system allows for better controllability of the plasma system.

With respect to the gas flow system, Ishii et al. discloses a cylindrical processing chamber used to process a substrate (see col. 4-lines 15-17), said cylindrical chamber including a top region and a peripheral region; a gas flow system (controller) 37 which is used to control the input gas lines which are in the lower peripheral portion of the substrate (see gas source 15 in Fig. 1 where the gas is directed into opposing sides of the wafer chuck) and the gas flow lines which are in the gas supply means 20 (for description of the apparatus of Fig. 1 see col. 4-line 15 – col. 6-line 62). Also, Suzuki et al. discloses a cylindrical processing chamber (see col. 4-lines 8-11) used to process a substrate, said plasma processing chamber including a top central region and a peripheral region; a gas flow system (34,38,40) coupled to said plasma processing chamber, said gas flow system controlling flow of input gas into at least two different regions, for instance, a top central region 36A, an upper peripheral region 36B, and a lower peripheral region 34C near the substrate, wherein the flow system controls the amount of volume and flow rate of the input gas (see Figs. 1-2 and col. 3-line 58 to col.

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6-line 9). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Ueda et al. so as to include the gas control system of either Ishii et al. or Suzuki et al., because this will allow for more uniform distribution of gas throughout the chamber and the wafer surface.

Claims 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al., U.S. Patent 5,810,932 in view of Kadomura, U.S. Patent 6,096,160 and further in view of Suzuki et al., U.S. Patent 5,522,934 and Singh et al., U.S. Patent 6,042,687.

Ueda et al., Kadomura, and Suzuki et al. are applied as above but lack anticipation of a gas delivery ring in the upper peripheral portion of the chamber. In response to the challenge of official notice, Singh et al. discloses that gas rings are conventionally used to provide a more uniform flow of gas (see column 1, lines 34-47). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Ueda et al. to include a gas ring in the upper peripheral portion in order to provide for a more even gas distribution.

### ***Response to Arguments***

Applicant's arguments filed 4/15/02 have been fully considered but they are not persuasive. Applicant argues that Suzuki fails to show flowing gas into a top central **region**. The examiner respectfully disagrees, since the use of the word "region" is

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taken to define more of an area than a point and in that sense is being interpreted broadly. The top central region in Suzuki, for instance, can be taken to be the inlet 36A and/or inlet 44 in Fig. 2. The examiner believes that this is a broad interpretation but at the same time is also a proper interpretation, so this rejection is maintained. Applicant also argues that Ishii et al. fails to show flowing the source gas from a peripheral region. However, this limitation is directed to an intended use of the apparatus and therefore this particular limitation is not given patentable weight in apparatus claims. Moreover, the apparatus of Ishii et al. is capable of flowing a source gas from the peripheral region, if such a method is desired to be performed in the apparatus.

With respect to the rejections under 35 USC 103, applicant argues these rejections together. Similarly, it is believed by the examiner that, at least in part, for the reasons described above, the rejections under 35 USC 103 are also proper.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of



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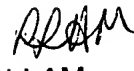
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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

  
LLAM  
May 1, 2002

  
GREGORY MILLS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700